

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A biological light measuring instrument comprising:

light irradiation means for irradiating light beams from a plurality of light irradiation positions to a subject;

light detection means for detecting light beams irradiated from said plurality of light irradiation positions and passing through the inside of said subject at a plurality of detection positions arranged near said plurality of light irradiation positions;

signal processing means for preparing a topographic image representing ~~ecological~~biological information about the inside of said subject by using quantities of light detected by said light detection means at the individual detection positions; and

memory means for memorizing a three-dimensional morphological image of said subject and reference points set thereon,

wherein said signal processing means includes:

means for setting three-dimensional coordinate data indicative of the positional relation between said light irradiation and light detection positions and reference points set on said subject;

means for generating a three-dimensional topographic image on the basis of said three-dimensional coordinate data; and

means for superimposing said three-dimensional topographic image onto said three-dimensional morphological image based on said set reference points.

2. (previously presented) A biological light measuring instrument according to claim 1, wherein said signal processing means further includes means for arranging said three-dimensional topographic image inside said subject at a predetermined depth from the surface of said subject in said three-dimensional morphological image.

3. (previously presented) A biological light measuring instrument according to claim 1, further comprising means for inputting three-dimensional morphological image data of said subject.

4. (previously presented) A biological light measuring instrument according to claim 1, wherein said signal processing means includes means for preparing a wire frame image of said subject as said morphological image.

5. (previously presented) A biological light measuring instrument according to claim 1, wherein said morphological image includes a tomographic image.

6. (previously presented) A biological light measuring instrument according to claim 5, wherein said morphological image includes a CT image.

7. (previously presented) A biological light measuring instrument according to claim 5, wherein said morphological image includes a MRI image.

8. (currently amended) A method of creating a topographic image in a biological light measuring instrument having means for irradiating light beams to a subject from a plurality of light irradiation positions, light detection means

for detecting light beams irradiated from said plurality of light irradiation positions and passing through the inside of said subject at a plurality of detection positions near said plurality of light irradiation positions, and signal processing means for preparing a topographic image indicative of ecological biological information about the inside of said subject by using quantities of light at individual detection positions detected by said light detection means, said method comprising the steps of:

memorizing a three-dimensional morphological image of said subject and reference points set thereon;

setting three-dimensional coordinate data indicative of the positional relation between said light irradiation and light detection positions and reference points set on said subject;

generating a three-dimensional topographic image on the basis of said three-dimensional coordinate data; and

superimposing said three-dimensional topographic image onto said three-dimensional morphological image based on said set reference points.

9. (previously presented) A topographic image creating method according to claim 8, wherein said step of displaying includes a step of arranging said three-dimensional topographic image inside said subject at a predetermined depth from the surface of said subject in said three-dimensional morphological image and displaying a resulting image.

10. (previously presented) A topographic image creating method according to claim 8, wherein said step of arranging said light irradiation positions and light detection positions on said morphological image includes a step of enlarging

or contracting coordinates of said light irradiation positions and light detection positions such that the reference points designated on said morphological image coincide with three-dimensional coordinate data corresponding to said reference points.

11. (previously presented) A topographic image creating method according to claim 8, wherein said morphological image includes a tomographic image.

12. (previously presented) A topographic image creating method according to claim 8, wherein said morphological image includes a CT image.

13. (previously presented) A topographic image creating method according to claim 8, wherein said morphological image includes a MRI image.

14. (previously presented) A topographic image creating method according to claim 8 further comprising a step of preparing a wire frame image of said subject as the three-dimensional morphological image of said subject.

15. (currently amended) A biological light measuring instrument according to claim 1, wherein said ecological-biological information comprises a change in concentration of hemoglobin.

16. (previously presented) A biological light measuring instrument according to claim 15, wherein said change in concentration of hemoglobin is obtained by using quantities of light detected of two wavelengths at each of said

detection positions.

17. (previously presented) A biological light measuring instrument according to claim 16, wherein said reference points are at least three.

18. (previously presented) A biological light measuring instrument according to claim 16, wherein said signal processing means comprises means for performing enlargement and contraction to bring real spatial coordinate values of said reference points measured with a three-dimensional position detection device into matching with said reference points on a three-dimensional image.

19. (previously presented) A biological light measuring instrument according to claim 1, wherein said signal processing means comprises means for correcting a two-dimensional topographic image for distance for conversion to said three-dimensional topographic image.

20. (previously presented) A biological light measuring instrument according to claim 19, wherein said means for correcting a two-dimensional topographic image for distance comprises means for multiplying a signal level of said two-dimensional topographic image by a weight according to a distance.

21. (previously presented) A biological light measuring instrument according to claim 19, wherein said means for correcting a two-dimensional topographic

image for distance uses a distance between a light irradiation position and a light detection position measured with a three-dimensional position detector.

22. (previously presented) A biological light measuring instrument according to claim 4, wherein said wire frame image is a three-dimensional image of a head of said subject.

23. (previously presented) A topographic image creating method according to claim 8, further comprising the steps of:

mounting fitting members for biological light measurement to a head of said subject applied with reference markers; and  
measuring real spatial coordinates of positions of reference points, light irradiation positions and light detection positions by a three-dimensional position detection device.

24. (previously presented) A topographic image creating method according to claim 8, further comprising the step of bringing real spatial coordinate values reference points measured with a three-dimensional position device into matching with reference points on a three-dimensional image by performing enlargement and contraction.

25. (currently amended) A biological light measuring system, comprising:

an image diagnostic device for obtaining a three-dimensional morphological image of a subject to be inspected;

light irradiation means for irradiating light beams from a plurality of light irradiation positions to said subject;

light detection means for detecting light beams irradiated from said plurality of light irradiation positions and passing through the inside of said subject at a plurality of detection positions arranged near said plurality of light irradiation positions;

signal processing means for preparing a topographic image representing ~~ecological~~biological information about the inside of said subject by using quantities of light detected by said light detection means at the individual detection positions;

memory means for memorizing said three-dimensional morphological image of said subject and reference points set thereon;

wherein said signal processing means includes:

means for setting three-dimensional coordinate data indicative of the positional relation between said light irradiation positions and said light detection positions and reference points set on said subject;

means for generating a three-dimensional topographic image on the basis of said three-dimensional coordinate data; and

means for superimposing said three-dimensional topographic image onto said three-dimensional morphological image based on said set reference points.